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### MCH 129.B01: Machine Quality Control and Precision Measurements

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**THE UNIVERSITY OF MONTANA MISSOULA  
MISSOULA COLLEGE  
INDUSTRIAL TECHNOLOGY DEPARTMENT**

**COURSE SYLLABUS**

**COURSE NUMBER AND TITLE:** MCH 129 Machine Quality Control & Precision Measurements

**DATE REVISED:** Autumn 2020

**SEMESTER CREDIT:** 3

**PREREQUISITES:** None

**INSTRUCTOR:** Jeffrey J. John

**E-MAIL:** Jeffrey.john@mso.umt.edu

**PHONE:** 406-369-5453

**OFFICE LOCATION:** Machining Lab

**OFFICE HOURS:** 8:00 am – 4:00 pm

**COURSE DESCRIPTION:** Instruction to a career as a machinist, the importance of being a machinist, professionalism in the trade, the opportunities that exist as a machinist, types of materials, surface finish on materials. Fraction to decimal conversion, inch to metric conversion, lean manufacturing principals, and the importance of safety.

**STUDENT PERFORMANCE OUTCOMES:**

Occupational Performance Objectives

Upon completion of this course, the student will be able to correctly:

1. Understand and read Micrometers.
2. Understand and read Dial Calipers.
3. Understand proper inspection set up.
4. Understand how to calibrate their measuring tools.
5. Understand how to read Dial indicators and height gauges

**STUDENT PERFORMANCE ASSESSMENT METHODS AND GRADING PROCEDURES:**

**STUDENT EXPECTATIONS:**

Students are expected to treat the class as they would a job in their field of study which means:

1. Follow all safety rules and classroom or laboratory procedures
2. Pay attention, take notes, and read and refer to the textbook
3. Bring all required materials daily, or lose a percentage point per occurrence
4. Participate in lab clean-up, which begins 30 minutes before the scheduled class end
5. Participate in semester end lab clean-up, or lose all of the professionalism grade
6. No food or drink, smoke-breaks, cell-phones or other personal multimedia in or during class
7. Observe safety practices for Covid-19

**TOOLS TO HELP ACHIEVE EMPLOYMENT**

8. Utilize online resume builder and create a one page letter of intent one paragraph only
9. Practice interview and work on interview skills with friends or Instructor

Each student will be responsible for cleaning the lab area in a team effort.

**COURSE GRADING SCALE:**

*A = 90% - 100%*

*B = 80% - 89%*

*C = 70% - 79%*

*D = 60% - 69%*

*F = <60%*

**IMPLIED FEATURE GRADING SCALE:**

*A ± .000" - .002" of design specifications\**

*B ± .0021" - .004" of design specifications\**

*C ± .0041" - .007" of design specifications\**

*D ± .0071" - .011" of design specifications\**

*F > .011" of design specifications\**

**NOTE: Courses must be passed with a 'C minus (C-)' or greater to count toward degree/certificate requirements.**

The following criteria will be used for grading. Grades will be posted periodically and will be available to students upon request during office hours.

**1. Assignments: 20%**

1. **Due Assignments** are to be turned in before 5 minutes after the class is scheduled to begin, otherwise it will be considered Late Work\*.
2. **Late Work** will not be accepted unless absences are excused; and are due the following day.
3. **Corrected Assignments** will be returned the Monday after they are corrected. If you are absent, acquire corrected assignments before or after class.
4. **Missed Assignments** will be made available to students with excused absences only.

**2. Tests: 15%**

1. Tests, quizzes, and pop quizzes will not be made up if missed.
2. Written test's:
  1. 3 attempts total\*
  2. >90% Score required to operate machinery
  3. Available every Monday at 8:00 AM
  4. Due every Friday at 12:00 AM

**3. Lab: 40%**

1. Quality of project workmanship (see Feature Grading Scale)
2. Quality of project measurement, processes, and quality control

**4. Professionalism: 10%**

1. Work ethic (safety, work done on time, care of tools and equipment, etc.)
2. Interpersonal skills (cooperation, leadership, participation, attitude, etc.)

**5. Attendance: 15%**

1. 3 unexcused absence = one letter grade drop
2. See attendance policy and student expectations

**ATTENDANCE POLICY:**

It is the student's responsibility to utilize class time to acquire and maintain skills in preparation for quizzes, exams, and completion of assignments and projects. Students must attend all lab and equipment safety/training days to be allowed access to the lab. Failure to do so may result in removal from the course.

**Three unexcused absence will result in one letter grade drop..**

Notify the instructor of absence(s) before scheduled class time, via phone or email listed above. Absences are considered an "unexcused absence" unless a doctor's note is received. There will be no "make-up" for quizzes, tests, or assignments missed due to unexcused absences. "Excused absences" will receive a matching number of days excusal period as absent starting immediately upon your return. It is the student's responsibility to get caught-up before course work is due.

**REQUIRED TEXTBOOKS**

GD&T by David P. Madsen ISBN-13:978-1605259383/ISBN-10:1605259381

Machinist's Ready Reference by C. Weingartner ISBN-13:978-0970339850/ISBN-10:0970339852

Machinery's Handbook 29<sup>th</sup> by Erik Oberg ISBN-13:978-0831129002/ISBN-10:083112900X

**REQUIRED MATERIALS AND TOOLS: (Failure to bring required materials results in -1% professionalism)**

1. Basic scientific calculator
2. 1" Dial Indicator
3. .030 test indicator
4. 6 " decimal scale (Starrett or equivalent)
5. 0-1 O.D. Micrometer (non digital)
6. Pocket scribe
7. Standard allen wrench set
8. Short sleeve smock
9. Paddle lock (for locker)
10. Safety glasses
11. Standard thread pitch gauge
12. Small dead blow mallet
13. Lathe turning tool set
14. 1/2" carbide end mill (2 or 4 fluted)
15. 4" or 6" Dial Caliper (no plastic)
16. 3 ring binder
17. Tool bag or small box

**ACADEMIC INTEGRITY:** All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at <http://www.umt.edu/SA/VP/SA/index.cfm/page/1321>.

**DISABILITY ACCOMMODATION:** Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact me after class or in my office. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the Disability Services website at <http://www.umt.edu/dss/> or call 406.243.2243 (Voice/Text).

NOTE: Faculty reserves the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances.

**COURSE OUTLINE:**

**1. Safety**

- Eye, ear, hand, lung, and other body protection
- Proper use of hand and power tools
- Shop and machine maintenance

**2. Measuring**

- Gage Blocks
- Calipers
- Micrometers
- Dial indicators

**3. Metals and Metal Identification**

- Steel Classifications
- Ferrous
- Non-ferrous
- Heat treating

**4. Machine Shop Layout**

- Surface preparation
- Layout tools
- Layout procedures

**GENERAL LAB SAFETY RULES**

All students must agree to follow this non-inclusive list of safety rules and professional behavior guidelines.

### Work Safely:

1. **Never work unsupervised.** All students must notify the instructor before and after working in the lab.
2. **Never work when impaired,** due to inadequate sleep or under the influence of alcohol or other substances.
3. **Never operate machinery without receiving proper instruction.**  
This includes but is not limited to passing Blackboard safety tests and the proper management of machine setup, speeds, feeds, and depths of cut, for any given process.
4. **Exercise as many safety precautions as possible,** including wearing safety glasses and other protective clothing and accessories at all times when working in the lab, including demonstrations and cleanup.
5. **Clean spills IMMEDIATELY!**

### Know what to do in case of an EMERGENCY:

1. Know the locations of machine and laboratory emergency shut-off switches and/or power boxes.
2. Know the locations, eyewash station, fire extinguishers, fire exits, and first aid kits.
3. Report all personal injuries immediately.
4. Prevent chemical accidents by familiarizing yourself with the chemical(s) in the MSDS.

### Violations of General Lab Safety Rules:

1. **1<sup>st</sup> offense:** Verbal warning.
2. **2<sup>nd</sup> offense OR any serious infraction:** Student is unable to use the facility for one (1) full day of scheduled lab time immediately following the offense.
3. **3<sup>rd</sup> offense OR any offense creating a dangerous situation:** Student may be subject to termination from the course.

**Safety messaging for in-person instruction and template language for the syllabi.** In an effort to communicate expectations and important safety messages to students returning to the classroom, the following important information should be communicated to in-person students on the first day of fall class. This information can also be included in course syllabi:

- Mask use is required within the classroom
- Each student is provided with a cleaning kit. The expectation is that students will clean their personal work space when they arrive for class, and before they leave the classroom
- Classrooms may have one-way entrances / exits to minimize crowding
- Students should be discouraged from congregating outside the classroom before and after class
- Specific seating arrangements will be used to ensure social distancing and support contact tracing efforts
- Class attendance will be recorded to support contact tracing efforts
- Drinking liquids and eating food is discouraged within the classroom (which requires mask removal)
- Information on the nearest “refill” stations for cleaning supplies/hand sanitizer if applicable
- If the class is being recorded, students must be notified of the recording
- Stay home if you feel sick and/or if exhibiting COVID-19 symptoms
- If the student is sick or displaying symptoms, please contact the Curry Health Center at (406) 243-4330
- Up-to-Date COVID-19 Information from the University of Montana
  - UM Coronavirus Website: <https://www.umt.edu/coronavirus>
  - UM COVID-19 Fall 2020 website: <https://www.umt.edu/coronavirus/fall2020.php>
- Strongly encourage students to remain vigilant outside the classroom in mitigating the spread of COVID-19

My signature below indicates that I have read and understand the descriptions, policies and procedures stated in the syllabus for MCH 129 Machining Quality Control & Precision Measurements:

Student Name (Print): \_\_\_\_\_

Student Signature: \_\_\_\_\_

Date Signed: \_\_\_\_\_